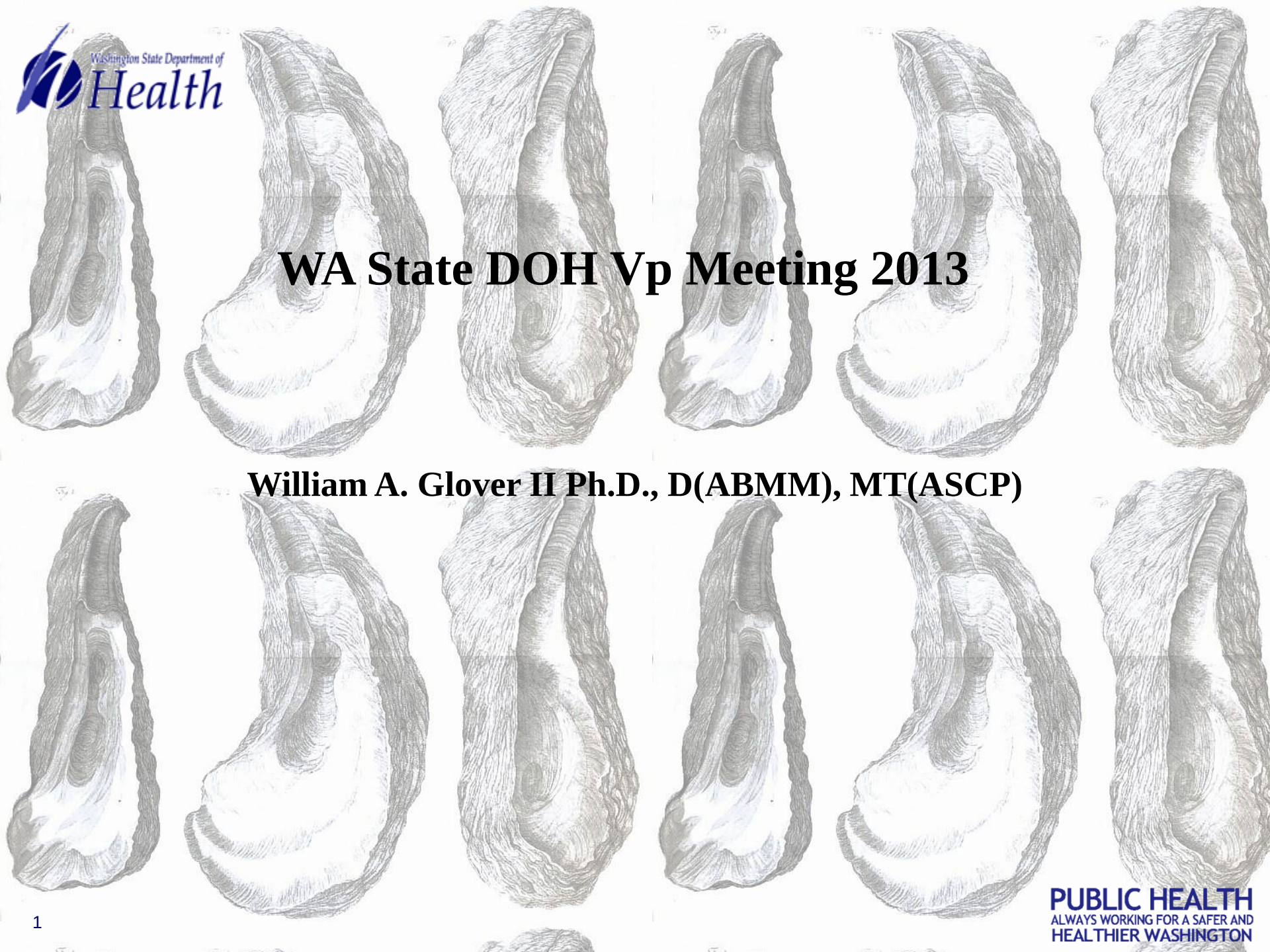


# WA State DOH Vp Meeting 2013

**William A. Glover II Ph.D., D(ABMM), MT(ASCP)**

# How do we address illnesses when they occur in presence of current control measures?

- **Gather further information to learn more about the situation**
  - Requires enhancement of available tools and resources to gather information
  - Strong partnerships with State epidemiologists and clinical laboratory partners
  - Information can be provided to state shellfish sanitation program to aid in decisions

- **Environmental Questions**
  - What is out there? How do we measure it? What does it mean? How does it change?

- **Clinical Questions**
  - Who is getting sick? What made them sick? Where was the source/sources? Is this an isolated illness or the tip of the iceberg?

- **Issues**
  - Limited funding and personnel
  - Time consuming
  - Lack of new available methods and gaps within basic knowledge regarding *Vibrio sp.*
  - What does the new information mean?
  - How to take action?

# *Enhanced Vibrio parahaemolyticus* surveillance Project

- **Overall Project Goal:** To expand and develop new surveillance tools that will allow WA State DOH to improve its ability to detect environmental sources of pathogenic *Vibrio parahaemolyticus* associated with and capable of causing human illness.

# Project Objectives

- **Bring on-board in-house serogrouping of *Vibrio parahaemolyticus* isolates.**
  - Rapid testing of (11 ) O groups and further serotyping for pandemic *V. parahaemolyticus.*

- **Development of a PFGE database for WA State *Vibrio parahaemolyticus* isolates which would include:**
  - Environmental isolates from WA State.
  - Clinical isolates from WA state submitted to the WA PHL.

- **Implementation of a new rapid real-time PCR based detection assay for clinical and environmental *Vibrio parahaemolyticus* isolates.**
  - Upgrades include additional pathogenic associated targets and internal control
    - *trh*, orf8, internal control

# Warning, Warning, Warning

**_Vibrio parahaemolyticus_ clinical isolates are vital to our WA State surveillance system!**

## WHY??

## Provide valuable information

- Indication of strains circulating
- Patient profile disease correlations
- Alert you to detect potential issues with control measures

## Issues

- Submission requirements vary by state
- Assurance and safeguards regarding patient data

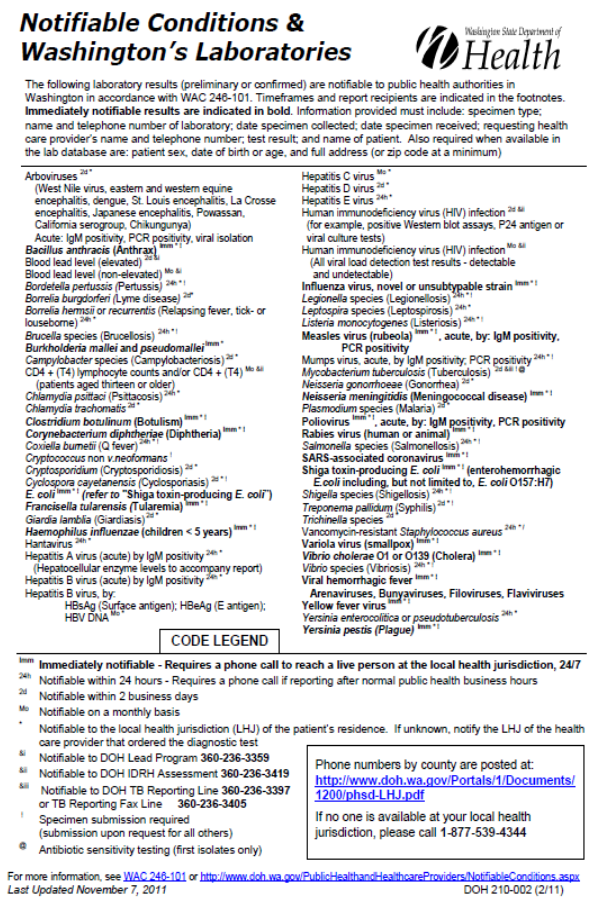
# WAC change for *Vibrio* (non-cholerae) Clinical Isolates

## ❑ Jan 1st 2012- Requirement for submission to WA PHL

- Provides isolate confirmation/identification
- Key component of disease surveillance

- **Aid in identify sources of transmission**

- **Confirmed cases info sent to CDC**
  - Confirm serotype
  - Helps us identify issues with testing
  - Used to develop and test new targets
  - Alerts us to presence of emerging species



**Notifiable Conditions & Washington's Laboratories**

Washington State Department of Health

The following laboratory results (preliminary or confirmed) are notifiable to public health authorities in Washington in accordance with WAC 246-101. Timeframes and report recipients are indicated in the footnotes. **Immediately notifiable results are indicated in bold.** Information provided must include: specimen type; name and telephone number of laboratory; date specimen collected; date specimen received; requesting health care provider's name and telephone number; test result; and name of patient. Also required when available in the lab database are: patient sex, date of birth or age, and full address (or zip code at a minimum)

Arboviruses [2d] *
(West Nile virus, eastern and western equine encephalitis, dengue, St. Louis encephalitis, La Crosse encephalitis, Japanese encephalitis, Powassan, California serogroup, Chikungunya)
Acute: IgM positivity, PCR positivity, viral isolation
***Bacillus anthracis* (Anthrax)** [Imm] * !
Blood lead level (elevated) [2d] &
Blood lead level (non-elevated) [Mo] &i
***Bordetella pertussis*** (Pertussis) [24h] * !
***Borrelia burgdorferi*** (Lyme disease) [2d]*
***Borrelia hermsii* or *recurrentis*** (Relapsing fever, tick- or louseborne) [24h] * !
***Brucella*** species (Brucellosis) [24h] * !
***Burkholderia mallei* and *pseudomallei*** [Imm] *
***Campylobacter*** species (Campylobacteriosis) [2d] *
CD4 + (T4) lymphocyte counts and/or CD4 + (T4) [Mo] &ii
(patients aged thirteen or older)
***Chlamydia psittaci*** (Psittacosis) [24h] *
***Chlamydia trachomatis*** [2d] *
***Clostridium botulinum* (Botulism)** [Imm] * !
***Corynebacterium diphtheriae* (Diphtheria)** [Imm] * !
***Coxiella burnetii*** (Q fever) [24h] *
***Cryptococcus* non *v.neoformans*** !
***Cryptosporidium*** (Cryptosporidiosis) [2d] *
***Cyclospora cayetanensis*** (Cyclosporiasis) [2d] * !
***E. coli*** [Imm] * ! ***(refer to "Shiga toxin-producing *E. coli*")***
***Francisella tularensis* (Tularemia)** [Imm] * !
***Giardia lamblia*** (Giardiasis) [2d] *
***Haemophilus influenzae* (children < 5 years)** [Imm] * !
Hantavirus [24h] *
Hepatitis A virus (acute) by IgM positivity [24h] *
(Hepatocellular enzyme levels to accompany report)
Hepatitis B virus (acute) by IgM positivity [24h] *
Hepatitis B virus, by:
HBsAg (Surface antigen); HBeAg (E antigen); HBV DNA [Mo] *
Hepatitis C virus [Mo] *
Hepatitis D virus [2d] *
Hepatitis E virus [24h] *
Human immunodeficiency virus (HIV) infection [2d] &ii
(for example, positive Western blot assays, P24 antigen or viral culture tests)
Human immunodeficiency virus (HIV) infection [Mo] &ii
(All viral load detection test results - detectable and undetectable)
**Influenza virus, novel or unsubtypable strain** [Imm] * !
***Legionella*** species (Legionellosis) [24h] * !
***Leptospira*** species (Leptospirosis) [24h] *
***Listeria monocytogenes*** (Listeriosis) [24h] * !
**Measles virus (rubeola)** [Imm] * !**, acute, by: IgM positivity, PCR positivity**
Mumps virus, acute, by IgM positivity, PCR positivity [24h] * !
***Mycobacterium tuberculosis*** (Tuberculosis) [2d &ii] * @
***Neisseria gonorrhoeae*** (Gonorrhea) [2d] *
***Neisseria meningitidis* (Meningococcal disease)** [Imm] * !
***Plasmodium*** species (Malaria) [2d] *
**Poliovirus** [Imm] * !**, acute, by: IgM positivity, PCR positivity**
**Rabies virus (human or animal)** [Imm] * !
***Salmonella*** species (Salmonellosis) [24h] * !
**SARS-associated coronavirus** [Imm] * !
**Shiga toxin-producing *E. coli*** [Imm] * ! **(enterohemorrhagic *E.coli* including, but not limited to, *E. coli* O157:H7)**
***Shigella*** species (Shigellosis) [24h] * !
***Treponema pallidum*** (Syphilis) [2d] * !
***Trichinella*** species [2d] *
Vancomycin-resistant ***Staphylococcus aureus*** [24h] * !
**Variola virus (smallpox)** [Imm] * !
***Vibrio cholerae* O1 or O139 (Cholera)** [Imm] * !
***Vibrio*** species (Vibriosis) [24h] * !
**Viral hemorrhagic fever** [Imm] * !
**Arenaviruses, Bunyaviruses, Filoviruses, Flaviviruses**
**Yellow fever virus** [Imm] * !
***Yersinia enterocolitica* or *pseudotuberculosis*** [24h] *
***Yersinia pestis* (Plague)** [Imm] * !

CODE LEGEND

[Imm] **Immediately notifiable - Requires a phone call to reach a live person at the local health jurisdiction, 24/7**
[24h] Notifiable within 24 hours - Requires a phone call if reporting after normal public health business hours
[2d] Notifiable within 2 business days
[Mo] Notifiable on a monthly basis
* Notifiable to the local health jurisdiction (LHJ) of the patient's residence. If unknown, notify the LHJ of the health care provider that ordered the diagnostic test
& Notifiable to DOH Lead Program **360-236-3359**
&i Notifiable to DOH IDRH Assessment **360-236-3419**
&ii Notifiable to DOH TB Reporting Line **360-236-3397** or TB Reporting Fax Line **360-236-3405**
! Specimen submission required (submission upon request for all others)
@ Antibiotic sensitivity testing (first isolates only)

Phone numbers by county are posted at: http://www.doh.wa.gov/Portals/1/Documents/1200/phsd-LHJ.pdf
If no one is available at your local health jurisdiction, please call 1-877-539-4344

For more information, see WAC 246-101 or http://www.doh.wa.gov/PublicHealthandHealthcareProviders/NotifiableConditions.aspx
*Last Updated November 7, 2011* DOH 210-002 (2/11)

# (In-house O serogrouping)

- **Denka Seiken (11 O groups)**
  - Positive controls for all 11 O groups

- **Performed on all clinical isolates**
  - Environmental isolates depends on available time

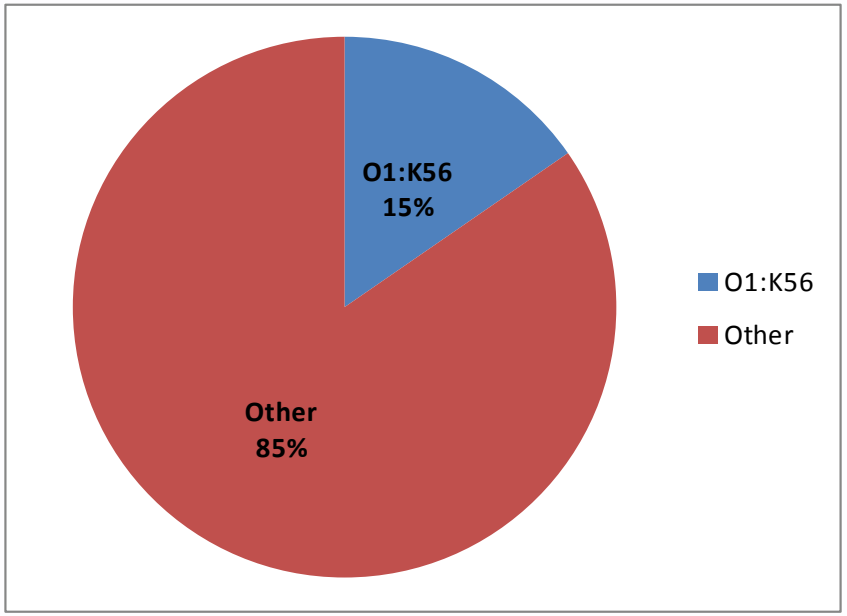
- **O serogrouping is being used to rapidly identify potential pandemic O3:K6 *Vibrio parahaemolyticus* isolates.**
  - K6 antisera kept in house as well

- **Serotype information is being gathered to be coupled with PFGE data to identify potential outbreaks and sources of transmission faster.**

- **Issues**
  - Short expiration, can be expensive,
  - Lots of K antisera (polyvalent k available-set of 9)

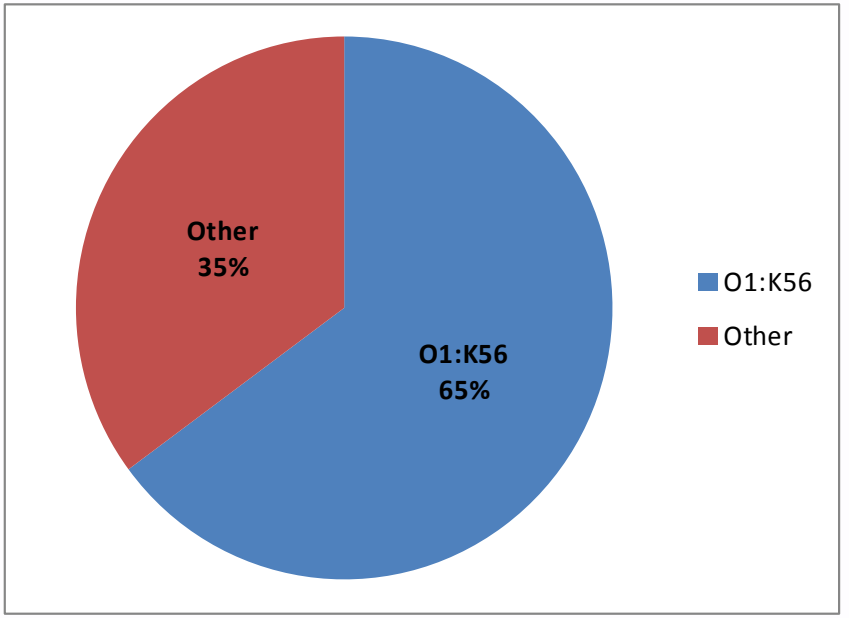
# Shifts in prevalence of clinical serotypes

## 2011 Clinical Isolates




Total **n=26**

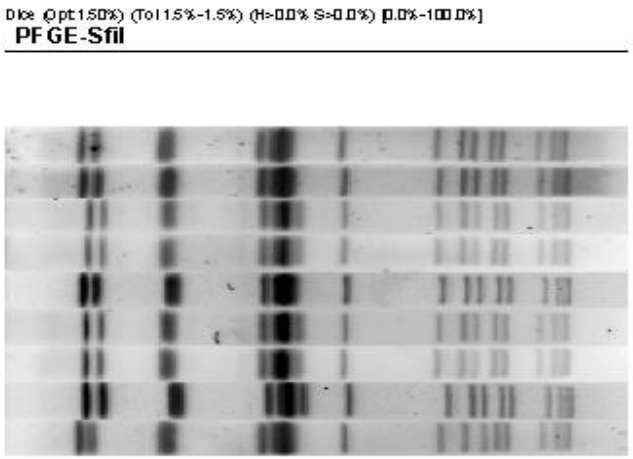
## 2012 Clinical Isolates




Total **n=41**

**•4 isolates still pending serotyping results from CDC**

# PFGE to aid in source determination

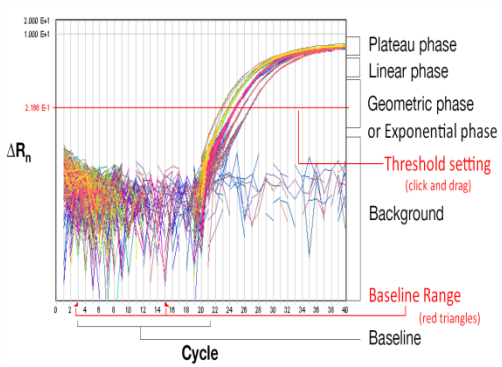



| | | | |
|---|---|---|---|
| Human | O3:Kuk | | Vp008 |
| Human | O3:Kuk | | Vp008 |
| Environmental | | Growing Area E | Vp021 |
| Environmental | | Growing Area E | Vp021 |
| Human | O3:Kuk | | Vp006 |
| Environmental | | Growing Area E | Vp007 |
| Environmental | | Growing Area E | Vp007 |
| Environmental | | Growing Area E | Vp007 |
| Human | O3:KuK | | Vp020 |

- **WA State *Vibrio parahaemolyticus* database is still in its infancy.**
  - Power comes with time and has potential to help address questions relating to linkages between shellfish growing/harvest areas and human illness.

- **Issues**
  - Limited personnel and resources (Time consuming)
    - Requires a sampling strategy
  - Must be used in conjunction with solid epidemiological information
  - Is not a magic wand---May not be able to resolve all multisource illnesses
    - Database requires continuous sampling of growing/harvesting sites overtime

# Improvements to current(real-time PCR) assay





## Upgrades

- Additional targets added to existing assay (*trh*, orf8), internal control
- (Validation planned)

## General Issues

- Possible cross reactions between known and unknown aquatic species in oyster homogenates

# 2012 Isolates Target Profile

- 37 clinical isolates showed this pattern
  - Composed of 4 different serotypes
- O1:K56 predominant serotype

| *tlh* | *tdh* | *trh* |
|---|---|---|
| + | + | + |

- Environmental isolates with similar pattern found
- PFGE and serogrouping were performed
- PFGE also performed on alt. patterns
- Epidemiology info gathered and compiled

| Environmental | *tlh* | *tdh* | *trh* |
|---|---|---|---|
| Isolate A | + | - | - |
| Isolate B | + | - | - |
| Isolate C | + | - | - |
| **Isolate D** | + | - | - |
| Isolate E | + | - | - |
| Isolate F | + | - | - |
| Isolate G | + | - | - |
| **Isolate H** | + | + | + |
| **Isolate I** | + | + | + |
| Isolate J | + | - | - |

# My Contact Info

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# PUBLIC HEALTH

## ALWAYS WORKING FOR A SAFER AND HEALTHIER WASHINGTON

# Environmental Isolate Collection